A7: Silt Fence

Definition
A temporary barrier of geotextile fabric installed on the contours across a slope used to intercept sediment laden runoff from small drainage areas of disturbed soil.

Purpose
The purpose of a silt fence is to reduce runoff velocity and effect deposition of transported sediment load. Limits imposed by ultraviolet stability of the fabric will dictate the maximum period the silt fence may be used (approximately one year).

Conditions Where Practice Applies
A silt fence may be used subject to the following conditions:

1. Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Steepness	Maximum Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

2. Maximum drainage area for overland flow to a silt fence shall not exceed ¼ acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence; and

3. Erosion would occur in the form of sheet erosion; and

4. There is no concentration of water flowing to the barrier.

Design Guidance
Design computations are not required for installations of 1 month or less. Longer installation periods should be designed for expected runoff. All silt fences shall be placed as close to the areas as possible, but at least 10 feet from the toe of a slope to allow for maintenance and roll down. The area beyond the fence must be undisturbed or stabilized.

Sensitive areas to be protected by silt fence may need to be reinforced by using heavy wire fencing for added support to prevent collapse.

Where ends of filter cloth come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

See **Figure A7.1** for details.

Silt fence which must be installed along a slope (at an angle of 30 degrees or greater from parallel to the contours) shall be installed in short lengths terminated with “J-hooks” as

illustrated in Figure **A7.2**. The J-hooks shall extend at least 20 feet from the line of the fence installation, and shall be spaced as follows:

Slope Steepness	Maximum J-Hook spacing (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

J-hook spacing shall be decreased if smaller J-hooks are used, for example along narrow road rights-of-way.

Criteria for Silt Fence Materials

1. Silt Fence Fabric: The fabric shall meet the following specifications unless otherwise approved by the appropriate erosion and sediment control plan approval authority. Such approval shall not constitute automatic future acceptance throughout Palau.

Fabric Properties	Minimum Acceptable Value	Test Method
Grab Tensile Strength (lbs)	90	ASTM D1682
Elongation at Failure (%)	50	ASTM D1682
Mullen Burst Strength (PSI)	190	ASTM D3786
Puncture Strength (lbs)	40	ASTM D751 (modified)
Slurry Flow Rate (gal/min/sf)	0.3	
Equivalent Opening Size	40-80	US Std Sieve CW-02215
Ultraviolet Radiation Stability (%)	90	ASTM G-26

2. Fence Posts (for fabricated units): The length shall be a minimum of 36 inches long. Wood posts will be of sound quality hardwood with a minimum cross sectional area of 3.0 square inches. Steel posts will be standard T and U section weighing not less than 1.00 pound per linear foot.

3. Wire Fence (for fabricated units): Wire fencing shall be a minimum 14 gage with a maximum 6 in. mesh opening, or as approved.

4. Prefabricated Units: Envirofence, Geofab, or approved equal, may be used in lieu of the above method providing the unit is installed per details shown in **Figure A7.1**.

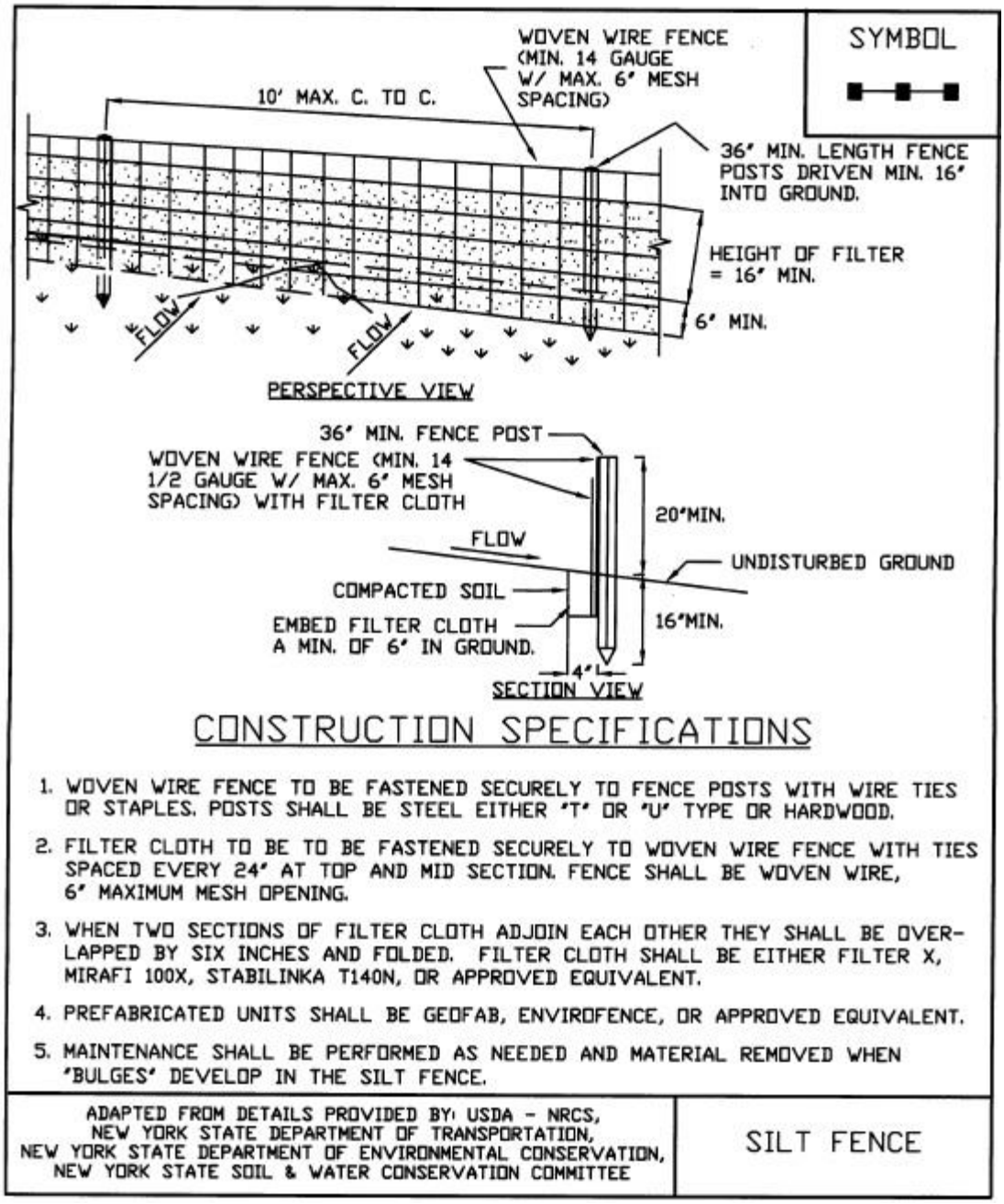
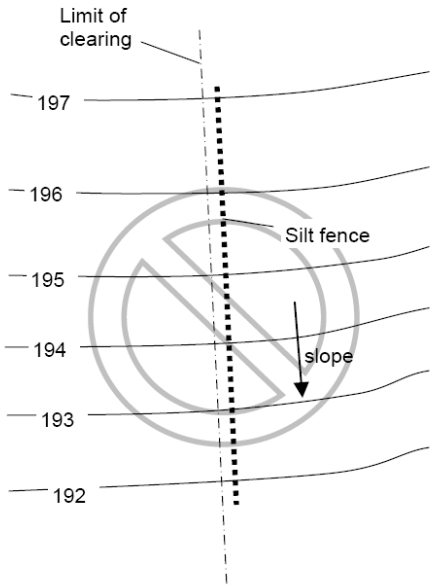
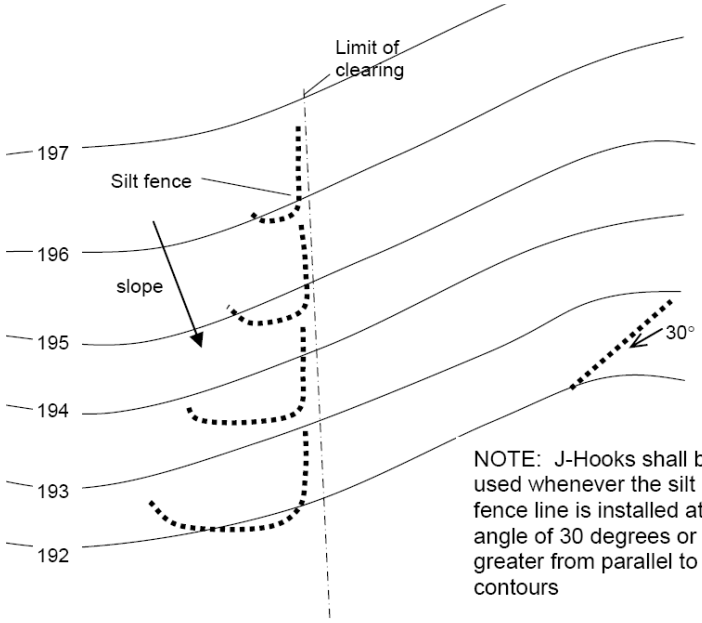


Figure A7.1 Silt Fence



INCORRECT

Silt fence installed parallel to slope (perpendicular to contour) in one, long run



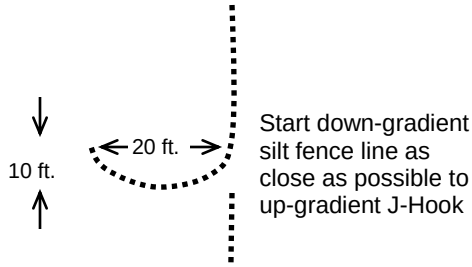
CORRECT

Silt fence installed in shorter runs with "J-Hooks" to avoid concentration of flows at one location by trapping runoff at multiple points along a slope.

Purpose:

The proper operation of silt fence depends on the ability to temporarily pond runoff behind the fence, allowing time for sediments to settle. Silt fence is ***not*** *a filter. If water flows around the end(s), the silt fence fails to function. It must be placed where it will store water - often times along a slope a* ***'smile'*** *or J-Hook shape is required to create a storage area. Long runs should be avoided, and broken up into smaller segments.*

Slope Steepness	Maximum Space between silt fence rows or J-hooks (ft.)
2:1 (50%)	25
3:1 (33%)	50
4:1 (25%)	75
5:1 or flatter (20%)	100



Typical J-Hook Dimensions

Minimum width of J-Hook recommended at 20 ft with a depth of 10 ft. Where space is limited (e.g., along narrow rights of way), narrower hooks can be used with a higher spacing frequency.

Figure A7.2 Installation of "J-Hooks" on slopes (Adapted from CNMI DEQ, 2009)